

LPDES PERMIT NO. LA0070262, AI No. 2340

LPDES STATEMENT OF BASIS
FOR THE DRAFT LOUISIANA POLLUTANT DISCHARGE ELIMINATION SYSTEM
(LPDES) PERMIT TO DISCHARGE TO WATERS OF LOUISIANA

- I. Company/Facility Name:** Chemtrade Refinery Services, Inc.
Shreveport Plant
P.O. Box 52147
Shreveport, LA 71135-2147
- II. Issuing Office:** Louisiana Department of Environmental Quality (LDEQ)
Office of Environmental Services
Post Office Box 4313
Baton Rouge, Louisiana 70821-4313
- III. Prepared By:** Jenniffer Sheppard
Water and Waste Permits Division
Phone #: 225-219-3135
E-mail: jenniffer.sheppard@la.gov

Date Prepared: December 20, 2005

IV. Permit Action/Status:

A. Reason For Permit Action:

Proposed reissuance of an expired Louisiana Pollutant Discharge Elimination System (LPDES) permit for a 5-year term following regulations promulgated at LAC 33:IX.2711/40 CFR 122.46*.

* In order to ease the transition from NPDES to LPDES permits, dual regulatory references are provided where applicable. The LAC references are the legal references while the 40 CFR references are presented for informational purposes only. In most cases, LAC language is based on and is identical to the 40 CFR language. 40 CFR Parts 401-402, and 404-471 have been adopted by reference at LAC 33:IX.4903 and will not have dual references. In addition, state standards (LAC Chapter 11) will not have dual references.

LAC 33:IX Citations: Unless otherwise stated, citations to LAC 33:IX refer to promulgated regulations listed at Louisiana Administrative Code, Title 33, Part IX.

40 CFR Citations: Unless otherwise stated, citations to 40 CFR refer to promulgated regulations listed at Title 40, Code of Federal Regulations in accordance with the dates specified at LAC 33:IX.4901, 4903, and 2301.F.

- B. NPDES permit - NPDES permit effective date:** N/A
NPDES permit expiration date: N/A
EPA has not retained enforcement authority.
- C. LPDES permit - LPDES permit effective date:** September 1, 1999
LPDES permit expiration date: August 31, 2004
- D. Application received on August 27, 2004**

V. Facility Information:

- A. Location - 10889 Highway 1 South in Shreveport
- B. Applicant Activity -

According to the application, Chemtrade Refinery Services, Inc., Shreveport Plant, is a sulfuric acid plant that produces various strengths of sulfuric acid using conventional contact process technology, using elemental sulfur and/or spent sulfuric acid as feedstock and through the regeneration of assorted sulfur-rich fuels. The process combusts the sulfur oxides and absorbs the combustion products into sulfuric acid. Sodium bisulfite is a by-product.

Peak Sulfur offers acid regeneration capabilities to service the oil refining and chemical industries. Oil refineries use Peak Sulfur's fresh and regenerated sulfuric acid in the process of making gasoline. Peak Sulfur recaptures spent acid from refinery customers, regenerates it and returns it for their use.

The technical grade product is primarily supplied to the paper production, oil refining, battery, industrial, land agriculture and chemical industries for water treatment, oil alkylation and strong acid application.

- C. Technology Basis - (40 CFR Chapter 1, Subchapter N/Parts 401-402, and 404-471 have been adopted by reference at LAC 33:IX.4903). It was determined that this facility is primarily a producer of sulfuric acid. It would be impossible to distinguish wastewater streams for the different products. Also, no wastewater develops in the creation of the sodium bisulfite. The air scrubber uses a caustic, which, when it comes in contact with the gaseous stream of SO_2 , creates sodium bisulfite. The sodium bisulfite is then collected and sent to trucks. This is done without generating any process wastewater.

These discharges are regulated under Federal Guidelines for Sodium Bisulfite at 40 CFR Part 415.540 or more specifically Subpart U of the Sulfuric Acid Production Subcategory. However, the guidelines under Subpart U have been reserved. Therefore, best professional judgement (BPJ) was applied for technology parameter limits in this permit as per the previous permits.

Sanitary wastewater is discharged to the city sewer system and therefore not addressed in this statement of basis.

Other sources of technology based limits:

LDEQ Stormwater Guidance, letter dated 6/17/87, from J. Dale Givens (LDEQ) to Myron Knudson (EPA Region 6).
Best Professional Judgement

- D. Fee Rate -
 - 1. Fee Rating Facility Type: Minor
 - 2. Complexity Type: IV - Based on previous permit
 - 3. Wastewater Type: II
 - 4. SIC code: 2819

- E. Continuous Facility Effluent Flow - 0.1615 MGD.

VI. Receiving Waters: Red River and Rush Bayou

Outfall 001 - Red River

1. TSS (15%), mg/L: 24.0
2. Average Hardness, mg/L CaCO₃: 187.00
3. Critical Flow, cfs: 1,344.25
4. Mixing Zone Fraction: 0.33
5. Harmonic Mean Flow, cfs: 7,760.88
6. River Basin: Red River, Segment No. 100101
7. Designated Uses:

The designated uses are primary contact recreation, secondary contact recreation, fish and wildlife propagation, oyster propagation, and agriculture.

Outfall 002 - Rush Bayou

1. River Basin: Red River, Segment No. 100601
2. This outfall is composed solely of low contamination potential stormwater. The designated uses are primary contact recreation, secondary contact recreation, fish and wildlife propagation, oyster propagation, and agriculture

Information based on the following: Water Quality Management Plan, Volume 5A, 1994; LAC 33:IX Chapter 11;/Recommendation(s) from the Engineering Section. Hardness and 15% TSS data come from monitoring station 0120, listed in Hardness and TSS Data for All LDEQ Ambient Stations for the Period of Record as of March 1998, LeBlanc.

VII. Outfall Information:

Outfall 001

- A. Type of wastewater - the discharge of process wastewater, process area stormwater, and utility wastewaters including boiler blowdown, cooling tower blowdown, non-return condensate, demineralization regeneration wastewater and general plant use wastewater (acid pump leakage wash).
- B. Location - Discharge from the northeast property boundary in an easement through Caddo-Bossier Port Commission property to the Red River at Latitude 32°21'24", Longitude 93°37'35".
- C. Treatment - The neutralization system utilizes both feed forward and feed back control to regulate effluent water pH. The feed forward signal to the control loop is a pH signal taken upstream of the acid/caustic additional point. If pH adjustment is required, dilute acid or caustic is added and the pH is again measured following the addition to give feed back control. Both pH signals are sent to a Foxboro DCS control system which regulates the acid or caustic addition based on both incoming and outgoing pH. A centrifugal pump then pumps the effluent water through a third pH cell where the pH is again checked and a signal is sent back to the control system. If for any reason the water does not meet discharge criteria, the facility has storage capacity to divert the discharge to tankage for further treatment.

- D. Flow - Continuous, 0.1615 MGD
- E. Receiving waters - Red River
- F. Basin and segment - Red River Basin, Segment 100101
- G. Effluent Data - The effluent data are contained in Appendix B.

Outfall 002

- A. Type of wastewater - low contamination potential stormwater.
- B. Location - Discharge from the south side of the property to an unnamed ditch at Latitude 32°21'21", Longitude 93°38'01".
- C. Treatment - None
- D. Flow - Intermittent
- E. Receiving waters - Red River and Rush Bayou
- F. Basin and segment - Red River Basin, Segment 100101

VIII. Existing Permit Limits:

Outfall 001 - the continuous discharge of boiler blowdown, cooling tower blowdown, demineralization regeneration, acid pump leakage wash, non-return condensate, process wastewater, and process area stormwater from a six inch CPVC pipe flowing underground from the northeast property boundary to the Red River.

Parameter	Monthly Average lbs/day	Daily Maximum lbs/day	Monitoring Frequency	Sample Type
Flow - MGD	Report	Report	Continuous	Recorder
Oil & Grease	13.3	20	1/month	Grab
TOC	---	67	1/month	Grab
Sulfates	Report	Report	1/month	Grab
Total Cadmium	0.266	0.367	1/month	24-Hr Composite
Total Chromium	0.331	0.458	1/month	24-Hr Composite
Total Copper	0.797	1.11	1/month	24-Hr Composite
Total Lead	0.266	0.367	1/month	24-Hr Composite
Total Mercury	0.052	0.124	1/month	24-Hr Composite

Parameter	Monthly Average lbs/day	Daily Maximum lbs/day	Monitoring Frequency	Sample Type
Total Nickel	0.531	0.733	1/month	24-Hr Composite
Total Zinc	0.663	0.915	1/month	24-Hr Composite
pH s.u. *	6.0	9.0	Continuous	Recorder
Whole Effluent Toxicity	Report	Report	1/quarter	24-Hr Composite

* pH range excursions apply

Outfall 002 - the intermittent discharge of low contamination potential stormwater runoff from the south side of the property

Parameter	Monthly Average	Daily Maximum	Monitoring Frequency	Sample Type
Flow - MGD	Report	Report	1/month	Estimate
TOC	---	50 mg/L	1/month	Grab
Oil & Grease	--	15 mg/L	1/month	Grab
Sulfates	Report lbs/day	Report lbs/day	1/month	Grab
pH s.u.	6.0	9.0	1/month	Grab

IX. Proposed Changes From Current Permit:

- A. Outfall 001 - Chemtrade Refinery Services, Inc. has requested a reduction in the measurement frequency for TOC, Oil & Grease, Total Cadmium, Total Chromium, Total Copper, Total Lead, Total Mercury, Total Nickel, and Total Zinc. Based on compliance history in accordance with the requirements stated in the USEPA Memorandum "Interim Guidance for Performance Based Reductions of NPDES Permit Monitoring Frequencies," the measurement frequency for TOC, Oil & Grease, Total Cadmium, Total Chromium, Total Lead, Total Mercury, Total Nickel, and Total Zinc has been changed from 1/month to 1/quarter. Due to an excursion of Total Copper, the 1/month monitoring frequency has been retained.
- B. Outfall 001 - Limits for TOC, Oil & Grease, Total Cadmium, Total Chromium, Total Copper, Total Lead, Total Mercury, Total Nickel, and Total Zinc increased due to slight change in flow. Previous flow value was 0.16 MGD and this proposed draft used a value of 0.1615 MGD.
- C. Outfall 001 - The monitoring frequency for toxicity testing has been reduced from 1/quarter to 1/year. This was based on a recommendation from LDEQ's toxicity group and is in accordance with LDEQ/OES Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards, EPA Region 6 Post-Third Round Whole

Effluent Toxicity Testing Frequencies (Revised June 30, 2000), and the Best Professional Judgement (BPJ).

- D. Outfall 002 - Chemtrade Refinery Services, Inc. has requested a reduction in the measurement frequency for TOC, and Oil & Grease. Based on compliance history in accordance with the requirements stated in the USEPA Memorandum "Interim Guidance for Performance Based Reductions of NPDES Permit Monitoring Frequencies," the measurement frequency for TOC and Oil & Grease has been changed from 1/month to 1/quarter.

X. Proposed Permit Limits:

Outfall 001 - the continuous discharge of process wastewater, process area stormwater, and utility wastewaters including boiler blowdown, cooling tower blowdown, non-return condensate, demineralization regeneration wastewater and general plant use wastewater (acid pump leakage wash).

Parameter	Monthly Average lbs/day	Daily Maximum lbs/day	Monitoring Frequency	Sample Type	Regulatory Basis
Flow - MGD	Report	Report	Continuous	Recorder	LAC 33:IX.2707.I.1.b
Oil & Grease	13.47	20.20	1/quarter	Grab	BPJ; LAC 33:IX.1113.C; Current LPDES Permit
TOC	---	67.35	1/quarter	Grab	BPJ; Current LPDES Permit
Sulfates	Report	Report	1/month	Grab	BPJ; Current LPDES Permit
Total Cadmium	0.268	0.370	1/quarter	24-Hr Composite	BPJ; Current LPDES Permit
Total Chromium	0.334	0.462	1/quarter	24-Hr Composite	BPJ; Current LPDES Permit
Total Copper	0.804	1.110	1/month	24-Hr Composite	BPJ; Current LPDES Permit
Total Lead	0.268	0.370	1/quarter	24-Hr Composite	BPJ; Current LPDES Permit
Total Mercury	0.058	0.125	1/quarter	24-Hr Composite	BPJ; Current LPDES Permit; water quality based effluent limitations
Total Nickel	0.536	0.739	1/quarter	24-Hr Composite	BPJ; Current LPDES Permit
Total Zinc	0.669	0.924	1/quarter	24-Hr Composite	BPJ; Current LPDES Permit
pH s.u. *	6.0	9.0	Continuous	Recorder	BPJ; Current LPDES Permit

Parameter	Monthly Average lbs/day	Daily Maximum lbs/day	Monitoring Frequency	Sample Type	Regulatory Basis
Whole Effluent Toxicity	Report	Report	1/year	24-Hr Composite	BPJ; Current LPDES Permit; Recommendation from Toxicity Section (See Appendix C)

* pH range excursions apply

Treatment: The neutralization system utilizes both feed forward and feed back control to regulate effluent water pH. The feed forward signal to the control loop is a pH signal taken upstream of the acid/caustic addition point. If pH adjustment is required, dilute acid or caustic is added and the pH is again measured following the addition to give feed back control. Both pH signals are sent to a Foxboro DCS control system which regulates the acid or caustic addition based on both incoming and outgoing pH. A centrifugal pump then pumps the effluent water through a third pH cell where the pH is again checked and a signal is sent back to the control system. If for any reason the water does not meet discharge criteria, the facility has storage capacity to divert the discharge to tankage for further treatment.

Monitoring Frequencies: Continuous monitoring for Flow and pH has been retained from the current LPDES permit. The sample type of recorder for Flow and pH has also been retained. Monitoring for TOC, Oil & Grease, Total Cadmium, Total Chromium, Total Lead, Total Mercury, Total Nickel, and Total Zinc has been established at 1/quarter. This reduction from the current LPDES permit is based on compliance history in accordance with the requirements stated in the USEPA Memorandum "Interim Guidance for Performance Based Reductions of NPDES Permit Monitoring Frequencies". TOC and Oil and Grease will be sampled by grab and Total Cadmium, Total Chromium, Total Copper, Total Lead, Total Mercury, Total Nickel, and Total Zinc will be done as a 24-Hr. Composite. Monthly monitoring for Total Copper has been retained from the current LPDES permit. The monthly monitoring and 24-Hr. Composite sample type for sulfates has also been retained from the current LPDES permit. Whole effluent toxicity frequency is based on a recommendation from LDEQ's toxicity group and is in accordance with LDEQ/OES Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards, EPA Region 6 Post-Third Round Whole Effluent Toxicity Testing Frequencies (Revised June 30, 2000), and the Best Professional Judgement (BPJ) (See Appendix D).

Outfall 002 - the intermittent discharge of low contamination potential stormwater runoff.

Parameter	Monthly Average	Daily Maximum	Monitoring Frequency	Sample Type	Regulatory Basis
Flow - MGD	Report	Report	1/month	Estimate	LAC 33:IX.2707.I.1.b
TOC	---	50 mg/L	1/quarter	Grab	BPJ; Current LPDES Permit; Current Stormwater Guidance
Oil & Grease	--	15 mg/L	1/quarter	Grab	BPJ; Current LPDES Permit; Current Stormwater Guidance
Sulfates	Report lbs/day	Report lbs/day	1/month	Grab	BPJ; Current LPDES Permit
pH s.u.	6.0	9.0	1/month	Grab	BPJ; Current LPDES Permit; Current Stormwater Guidance

Treatment - none

Monitoring Frequencies: Flow will be monitored 1/month by estimate, retained from the current LPDES permit. Sulfates and pH will also be monitored 1/month by grab sample. The frequency and sample type were retained from the current LPDES permit. The monthly monitoring and 24-Hr. Composite sample type for TOC and Oil and Grease have been reduced from 1/month to 1/quarter in accordance with the requirements stated in the USEPA Memorandum "Interim Guidance for Performance Based Reductions of NPDES Permit Monitoring Frequencies".

XI. Permit Limit Rationale:

The following section sets forth the principal facts and the significant factual, legal, methodological, and policy questions considered in preparing the draft permit. Also set forth are any calculations or other explanations of the derivation of specific effluent limitations and conditions, including a citation to the applicable effluent limitation guideline or performance standard provisions as required under LAC 33:IX.2707/40 CFR Part 122.44 and reasons why they are applicable or an explanation of how the alternate effluent limitations were developed.

A. TECHNOLOGY-BASED VERSUS WATER QUALITY STANDARDS-BASED EFFLUENT LIMITATIONS AND CONDITIONS

Following regulations promulgated at LAC 33:IX.2707.L.2.b/40 CFR Part 122.44(I)(2)(ii), the draft permit limits are based on either technology-based effluent limits pursuant to LAC 33:IX.2707.A/40 CFR Part 122.44(a) or on State water quality standards and requirements pursuant to LAC 33:IX.2707.D/40 CFR Part 122.44(d), whichever are more stringent.

B. TECHNOLOGY-BASED EFFLUENT LIMITATIONS AND CONDITIONS

Regulations promulgated at LAC 33:IX.2707.A/40 CFR Part 122.44(a) require technology-based effluent limitations to be placed in LPDES permits based on effluent limitations guidelines where applicable, on BPJ (best professional judgement) in the absence of

guidelines, or on a combination of the two. The following is a rationale for types of wastewaters. See outfall information descriptions for associated outfall(s) in Section VII. The proposed technology limitations and conditions are based on the existing permits for the facility and 40 CFR 415.540.

1. Outfall 001 - Process Wastewaters

Outfall 001 - the continuous discharge of process wastewater, process area stormwater, and utility wastewaters including boiler blowdown, cooling tower blowdown, non-return condensate, demineralization regeneration wastewater and general plant use wastewater (acid pump leakage wash).

The previous NPDES Permit No. LA0070262 utilized the Inorganic Chemical Development Document, WPA 440/1-82/007, to develop specific requirements for the metal limits in the process wastewater. It was determined that this stream must meet BAT treatment technology for the process wastewater. Utility wastewaters discharged with the process wastewater received BPJ (Best Professional judgement) in the previous permit.

The conventional pollutant pH will be regulated by LAC 33:IX.1113.C Oil and grease regulation is proposed at API separator technology levels, (10 and 15 mg/l daily average and daily maximum respectively). Calculations are as follows:

<u>Effluent Characteristic</u>	<u>Limit (mg/l)</u>	<u>Flow (MGD)</u>	<u>Limit (lbs/day)</u>
Oil and Grease (average)	10 x	0.1615 x 8.34	13.47
Oil and Grease (maximum)	15 x	0.1615 x 8.34	20.20

The nonconventional pollutant total organic carbon is proposed to be regulated at 50 mg/l daily maximum. This level is based on EPA and LDEQ Stormwater Policy.

<u>Effluent Characteristic</u>	<u>Limit (mg/l)</u>	<u>Flow (MGD)</u>	<u>Limit (lbs/day)</u>
Total Organic Carbon (TOC)	50 x	0.1615 x 8.34	67.35

The treatment technologies for priority metals used in the current permit were based upon 1) a well documented data base, 2) a consistently low level long term average result, and 3) methodology compatible with the nature of the discharge. The treatment technology chosen was lime/filtration even though the company uses caustic for neutralization. Mercury, however, was based upon sulfide/filtration. After the long term average for each metal was established, statistical methods were utilized to establish effluent limitations at levels where the well designed and well operated plant can operate in compliance. This level has been shown to be at the 95th percentile for the daily average and the 99th percentile for the daily maximum. The data derived are shown in the following table. The C_v for daily average was 0.6 and the C_v for daily maximum was 0.75. Normal distribution statistical methods were used in calculation the effluent levels.

BAT TREATMENT LIMITATIONS

Metal	Treatment Technology	LTA	Daily Avg. 95th Percentile	Daily Max. 99th Percentile
	(*1)	$\mu\text{G/l}$	$C_v = 0.6$	$C_v = 0.75$
Cadmium	L/F	100	199	275
Chromium	Redox/L/F	125	248	343
Copper	L/F	300	597	824
Mercury	L/F	34	68	93
Nickel	L/FC/F	200	398	549
Lead	L/FC/F	100	199	275
Zinc	L/F	250	497	686

(*1) L = lime; FC = Ferric Chloride; and F = Filtration
Calculations for the parameter limits are as follows:

Effluent Characteristic	Limit (mg/l)	Flow (MGD)	Limit (lbs/day)
Total Cadmium (Avg)	0.199 x	$0.1615 \times 8.34 =$	0.268
Total Cadmium (Max)	0.275 x	$0.1615 \times 8.34 =$	0.370
Total Chromium (Avg)	0.248 x	$0.1615 \times 8.34 =$	0.334
Total Chromium (Max)	0.343 x	$0.1615 \times 8.34 =$	0.462
Total Copper (Avg)	0.597 x	$0.1615 \times 8.34 =$	0.804
Total Copper (Max)	0.824 x	$0.1615 \times 8.34 =$	1.110
Total Lead (Avg)	0.199 x	$0.1615 \times 8.34 =$	0.268
Total Lead (Max)	0.275 x	$0.1615 \times 8.34 =$	0.370
Total Mercury (Avg)	0.068 x	$0.1615 \times 8.34 =$	0.091
Total Mercury (Max)	0.093 x	$0.1615 \times 8.34 =$	0.125
Total Nickel (Avg)	0.398 x	$0.1615 \times 8.34 =$	0.536
Total Nickel (Max)	0.549 x	$0.1615 \times 8.34 =$	0.739
Total Zinc (Avg)	0.497 x	$0.1615 \times 8.34 =$	0.669
Total Zinc (Max)	0.686 x	$0.1615 \times 8.34 =$	0.924

For more a more explicit definition of treatment technologies for the above mentioned metals, see STATEMENT OF BASIS FOR THE DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE TO WATERS OF THE UNITED STATES, Permit No. LA0070262, May 6, 1993.

Although primarily a sulfuric acid plant, Chemtrade Refinery Services, Inc. does manufacture some sodium bisulfite as a by-product. The sodium bisulfite has no wastewater associated with it's production.

Site-Specific Consideration(s)

None

2. Outfall 002 - Stormwater

Outfall 002 - the intermittent discharge of low contamination potential stormwater runoff.

Uncontaminated or low potential contaminated stormwater discharged through discrete outfall(s) not associated with process wastewater shall receive the following BPJ limitations in accordance with this Office's guidance on stormwater, letter dated 6/17/87, from J. Dale Givens (LDEQ) to Myron Knudson (EPA Region 6).

Parameter	Monthly Average mg/L Report	Daily Maximum mg/L Report
Flow, MGD	N/A	50
TOC	N/A	15
Oil and Grease	Report	Report
Sulfates	6.0 (min)	9.0 (max)
pH, Std. Units		

Site-Specific Consideration(s)

In accordance with LAC 33:IX.2707.I.3 and [40 CFR 122.44(I)(3) and (4)], a Part II condition is proposed for applicability to all storm water discharges from the facility, either through permitted outfalls or through outfalls which are not listed in the permit or as sheet flow. The Part II condition requires a Storm Water Pollution Prevention Plan (SWP3) within six (6) months of the effective date of the final permit, along with other requirements. If the permittee maintains other plans that contain duplicative information, those plans could be incorporated by reference to the SWP3. Examples of these type plans include, but are not limited to: Spill Prevention Control and Countermeasures Plan (SPCC), Best Management Plan (BMP), Response Plans, etc. The conditions will be found in the draft permit. Including Best Management Practice (BMP) controls in the form of a SWP3 is consistent with other LPDES and EPA permits regulating similar discharges of stormwater associated with industrial activity, as defined in LAC 33:IX.2522.B.14 [40 CFR 122.26(b)(14)].

C. WATER QUALITY-BASED EFFLUENT LIMITATIONS

Technology-based effluent limitations and/or specific analytical results from the permittee's application were screened against state water quality numerical standard based limits by following guidance procedures established in the Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards, LDEQ, September 27, 2001. Calculations, results, and documentation are given in Appendix B.

In accordance with LAC 33:IX.2707.D.1/40 CFR § 122.44(d)(1), the existing (or potential) discharge (s) was evaluated in accordance with the Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards, LDEQ, September 27, 2001, to determine whether pollutants would be discharged "at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard." Calculations, results, and documentation are given in Appendix B.

The following pollutants received water quality based effluent limits:

Total Mercury

Minimum quantification levels (MQL's) for state water quality numerical standards-based effluent limitations are set at the values listed in the Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards, LDEQ, September 27, 2001. They are also listed in Part II of the permit.

TMDL Waterbodies

Outfalls 001

The discharges from Outfall 001 includes process wastewater, utility wastewater, and stormwater runoff are to Red River, Segment No. 100101. The Red River is listed on the 303(d) report as being impaired with sulfates and color. A TMDL is scheduled to be completed by March 2007-2008.

Color

Based on the evaluation of the effluent discharges, it was determined that the facility does not have the potential to contribute to the color impairment.

Sulfates

To further evaluate the sulfate impairment in this waterbody, reporting requirements from the current LPDES permit have been retained.

Outfall 002

Outfall 002 includes low contamination potential stormwater and discharges to Rush Bayou, Subsegment No. 100601. Rush Bayou is listed on the 303(d) report as being impaired with organic enrichment/low DO and nutrients. A TMDL is scheduled to be completed by March 2007-2008. The discharges from this outfall are not reasonable expected to cause further nutrient impairment.

Organic Enrichment/Low DO

A daily maximum TOC limitation of 50 mg/L has been retained from the current LPDES permit to ensure no further impairment to this stream.

A reopener clause will be established in the permit to include more stringent limits based on final loading allocations upon completion of an approved TMDL.

Site-Specific Consideration(s)

None

D. **Biomonitoring Requirements**

It has been determined that there may be pollutants present in the effluent which may have the potential to cause toxic conditions in the receiving stream. The State of Louisiana has established a narrative criteria which states, "toxic substances shall not be present in quantities that alone or in combination will be toxic to plant or animal life."

The Office of Environmental Services requires the use of the most recent EPA biomonitoring protocols.

Whole effluent biomonitoring is the most direct measure of potential toxicity which incorporates both the effects of synergism of effluent components and receiving stream water quality characteristics. Biomonitoring of the effluent is, therefore, required as a condition of this permit to assess potential toxicity. The biomonitoring procedures stipulated as a condition of this permit for Outfall(s) 001 are as follows:

TOXICITY TESTS

FREQUENCY

Acute static renewal 48-hour
definitive toxicity test
using Daphnia pulex

1/year

Acute static renewal 48-hour
definitive toxicity test
using fathead minnow (Pimephales
promelas)

1/year

Toxicity tests shall be performed in accordance with protocols described in the latest revision of the "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms." The stipulated test species are appropriate to measure the toxicity of the effluent consistent with the requirements of the State water quality standards. The biomonitoring frequency has been established to reflect the likelihood of ambient toxicity and to provide data representative of the toxic potential of the facility's discharge in accordance with regulations promulgated at LAC 33:IX.2715/40 CFR Part 122.48.

Results of all dilutions as well as the associated chemical monitoring of pH, temperature, hardness, dissolved oxygen, conductivity, and alkalinity shall be documented in a full report according to the test method publication mentioned in the previous paragraph. The permittee shall submit a copy of the first full report to the Office of Environmental Compliance. The full report and subsequent reports are to be retained for three (3) years following the provisions of Part III.C.3 of this permit. The permit requires the submission of certain toxicity testing information as an attachment to the Discharge Monitoring Report.

This permit may be reopened to require effluent limits, additional testing, and/or other appropriate actions to address toxicity if biomonitoring data show actual or potential ambient toxicity to be the result of the permittee's discharge to the receiving stream or water body. Modification or revocation of the permit is subject to the provisions of LAC 33:IX.3105/40 CFR 124.5. Accelerated or intensified toxicity testing may be required in accordance with Section 308 of the Clean Water Act.

Dilution Series

The permit requires five (5) dilutions in addition to the control (0% effluent) to be used in the toxicity tests. These additional effluent concentrations shall be 0.25%, 0.33%, 0.44%, 0.59%, and 0.78%. The low-flow effluent concentration (critical dilution) is defined as 0.59% effluent.

XII. Compliance History/DMR Review:

A. Inspection

A facility inspection was conducted on September 17, 2003. No areas of concern were noted.

A facility inspection was conducted on September 13, 2004. All areas for wastewater were noted as being satisfactory.

B. DMRs

A DMR review was done covering the period of January 2003 through December 2005.

<u>Date</u>	<u>Parameter</u>	<u>Outfall</u>	<u>Reported Value</u>	<u>Permit Limits</u>
12/01/04	Total Copper	001	1.150 lbs/day dly max	1.110 lbs/day dly max

C. Enforcement Actions

There are no open enforcement actions as of December 21, 2005.

XIII. "IT" Questions - Applicant's Responses

Chemtrade Refinery Services, Inc. is a minor facility without any major changes, therefore, was not required to answer IT Questions.

XIV. ENDANGERED SPECIES

The receiving waterbody, Subsegment 100101 of the Red River Basin is not listed in Section II.2 of the Implementation Strategy as requiring consultation with the U.S. Fish and Wildlife Service (FWS). This strategy was submitted with a letter dated October 21, 2005 from Watson (FWS) to Gautreaux (LDEQ). Therefore, in accordance with the Memorandum of Understanding between the LDEQ and the FWS, no further informal (Section 7, Endangered Species Act) consultation is required. It was determined that the issuance of the LPDES permit is not likely to have an adverse effect on any endangered or candidate species or the critical habitat. The effluent limitations established in the permit ensure protection of aquatic life and maintenance of the receiving water as aquatic habitat.

XV. Historic Sites:

The discharge is from an existing facility location, which does not include an expansion on undisturbed soils. Therefore, there should be no potential effect to sites or properties on or eligible for listing on the National Register of Historic Places, and in accordance with the

"Memorandum of Understanding for the Protection of Historic Properties in Louisiana Regarding LPDES Permits" no consultation with the Louisiana State Historic Preservation Officer is required.

XVI. Tentative Determination:

On the basis of preliminary staff review, the Department of Environmental Quality has made a tentative determination to permit for the discharge described in the application.

XVII. Variances:

No requests for variances have been received by this Office.

XVIII. Public Notices:

Upon publication of the public notice, a public comment period shall begin on the date of publication and last for at least 30 days thereafter. During this period, any interested persons may submit written comments on the draft permit and may request a public hearing to clarify issues involved in the permit decision at this Office's address on the first page of the statement of basis. A request for a public hearing shall be in writing and shall state the nature of the issues proposed to be raised in the hearing.

Public notice published in:

Local newspaper of general circulation

Office of Environmental Services Public Notice Mailing List

Appendix A

Developer: Bruce Fielding Time: 10:52 AM

Software: Lotus 4.0

LA0070262, AI2340

Revision date: 02/14/05

Water Quality Screen for Chemtrade Refinery Services, Inc

Input variables:

Receiving Water Characteristics:

Dilution:

Toxicity Dilution Series:

ZID Fs = 0.033333

Biomonitoring dilution: 0.005574

Receiving Water Name= Red River

Dilution Series Factor: 0.75

Critical flow (Qr) cfs= 1344.25

MZ Fs = 0.333333

Harm. mean/avg tidal cfs= 7760.88

Critical Qr (MGD)=868.7888

Drinking Water=1 HHNPCR=2 1

Harm. Mean (MGD)= 5015.857

Marine, 1=y, 0=n

ZID Dilution = 0.005546

Dilution No. 1 0.743%

Rec. Water Hardness= 187

MZ Dilution = 0.000557

Dilution No. 2 0.5574%

Rec. Water TSS= 24

HHnc Dilution= 0.000186

Dilution No. 3 0.4180%

Fisch/Specific=1,Stream=0

HHc Dilution= 0.000032

Dilution No. 4 0.3135%

Diffuser Ratio=

ZID Upstream = 179.3166

Dilution No. 5 0.2351%

MZ Upstream = 1793.166

Effluent Characteristics:

MZhhnc Upstream= 5379.497

Partition Coefficients; Dissolved-->Total

Permittee= Chemtrade Refinery Services, Inc

METALS FW

Permit Number= LA0070262, AI2340

Total Arsenic 2.132135

Facility flow (Qef),MGD= 0.1615

MZhhc Upstream= 31057.94

Total Cadmium 3.64626

ZID Hardness= ---

Chromium III 5.197146

Outfall Number = 001

MZ Hardness= ---

Chromium VI 1

Eff. data, 2=lbs/day 2

ZID TSS= ---

Total Copper 3.376229

MQL, 2=lbs/day 1

MZ TSS= ---

Total Lead 6.28689

Effluent Hardness= N/A

Multipliers:

Total Mercury 2.858525

Effluent TSS= N/A

WLAA --> LTAA 0.32

Total Nickel 2.921706

WQBL ind. 0=y, 1=n

WLAC --> LTAC 0.53

Total Zinc 4.243197

Acute/Chr. ratio 0=n, 1=y 1

LTA a,c-->WQBL avg 1.31

Aquatic,acute only1=y,0=n

LTA a,c-->WQBL max 3.11

LTA h --> WQBL max 2.38

Aquatic Life, Dissolved

Metal Criteria, ug/L

Page Numbering/Labeling

WQBL-limit/report 2.13

METALS ACUTE CHRONIC

Appendix Appendix A-1

WLA Fraction 1

Arsenic 339.8 150

Page Numbers 1=y, 0=n 1

WQBL Fraction 1

Cadmium 62.64781 1.636933

Input Page # 1=y, 0=n 1

Conversions:

ug/L-->lbs/day Qef0.001347

ug/L-->lbs/day Qeo 0

ug/L-->lbs/day Qr 11.21105

lbs/day-->ug/L Qeo742.4401

lbs/day-->ug/L Qef742.4401

diss-->tot 1=y0=n 1

Cu diss-->tot1=y0=n 1

cfs-->MGD 0.6463

Chromium III 916.2277 297.2148

Chromium VI 15.712 10.582

Copper 33.23251 20.97141

Lead 126.7521 4.939346

Mercury 1.734 0.012

Nickel 2403.583 266.9372

Zinc 194.5079 177.6152

Fischer/Site Specific inputs:

Pipe=1,Canal=2,Specific=3

Pipe width, feet

ZID plume dist., feet

MZ plume dist., feet

HHnc plume dist., feet

HHc plume dist., feet

Fischer/site specific dilutions:

F/specific ZID Dilution = ---

Receiving Stream:

F/specific MZ Dilution = ---

Default Hardness= 25

F/specific HHnc Dilution= ---

Default TSS= 10

F/specific HHc Dilution= ---

99 Crit., 1=y, 0=n 1

Site Specific Multiplier Values:

CV = ---

N = ---

WLAA --> LTAA ---

WLAC --> LTAC ---

LTA a,c-->WQBL avg ---

LTA a,c-->WQBL max ---

LTA h --> WQBL max ---

Appendix A-1

Page 2

Chemtrade Refinery Services, Inc

LA0070262, A12340

(*1)	(*2)	(*3)	(*4)	(*5)	(*6)	(*7)	(*8)	(*9)	(*10)	(*11)
Toxic	CuEffluent		Effluent	MQLEffluent		95th %	Numerical Criteria		HH	
Parameters	Instream	/Tech	/Tech	1=No	95%	estimate	Acute	Chronic	HHDW	Carcinogen
	Conc.	(Avg)	(Max)	0=95 %	Non-Tech		FW	FW		Indicator
	ug/L	lbs/day	lbs/day	ug/L	lbs/day		ug/L	ug/L	ug/L	"C"
NONCONVENTIONAL										
Total Phenols (4AAP)				5			700	350	5	
3-Chlorophenol				10					0.1	
4-Chlorophenol				10			383	192	0.1	
2,3-Dichlorophenol				10					0.04	
2,5-Dichlorophenol				10					0.5	
2,6-Dichlorophenol				10					0.2	
3,4-Dichlorophenol				10					0.3	
2,4-Dichlorophenoc-										
acetic acid (2,4-D)				---					100	
2-(2,4,5-Trichlorophen-										
oxy) propionic acid										
(2,4,5-TP, Silvex)				---					10	
METALS AND CYANIDE										
Total Arsenic				10			724.4995	319.8203	106.6068	
Total Cadmium	0.268	0.37		1	1		228.4302	5.968684	36.4626	
Chromium III	0.334	0.462		10	1		4761.769	1544.669	259.8573	
Chromium VI	0.334	0.462		10	1		15.712	10.582	50	C
Total Copper	0.804	1.11		10	1		112.2006	70.8043	3376.229	
Total Lead	0.268	0.37		5	1		796.8763	31.05313	314.3445	
Total Mercury	0.091	0.125		0.2	1		4.956682	0.034302	5.71705	
Total Nickel	0.536	0.739		40	1		7022.563	779.9119		
Total Zinc	0.669	0.924		20	1		825.3354	753.6564	21215.99	
Total Cyanide				20			45.9	5.2	663.8	
DIOXIN										
2,3,7,8 TCDD; dioxin			1.0E-005						7.1E-007	C
VOLATILE COMPOUNDS										
Benzene				10			2249	1125	1.1	C
Bromoform				10			2930	1465	3.9	C
Bromodichloromethane				10					0.2	C
Carbon Tetrachloride				10			2730	1365	0.22	C
Chloroform				10			2890	1445	5.3	C
Dibromochloromethane				10					0.39	C
1,2-Dichloroethane				10			11800	5900	0.36	C
1,1-Dichloroethylene				10			1160	580	0.05	C
1,3-Dichloropropylene				10			606	303	9.86	
Ethylbenzene				10			3200	1600	2390	
Methyl Chloride				50			55000	27500		
Methylene Chloride				20			19300	9650	4.4	C
1,1,2,2-Tetrachloro-										
ethane				10			932	466	0.16	C

Appendix A-1

Page 3

Chemtrade Refinery Services, Inc
LA0070262, AI2340

(*1)	(*12)	(*13)	(*14)	(*15)	(*16)	(*17)	(*18)	(*19)	(*20)	(*21)	(*22)	(*23)
Toxic	WLAa	WLAC	WLAh	LTAA	LTAC	LTAh	Limiting	WQBL	WQBL	WQBL	WQBL	Need
Parameters	Acute	Chronic	HHDW	Acute	Chronic	HHDW	A,C,HH	Avg	Max	Avg	Max	WQBL?
	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	lbs/day	lbs/day	
NONCONVENTIONAL												
Total Phenols (4AAP)	126221.6	627958	26902.49	40390.91	332817.7	26902.49	26902.49	26902.49	64027.92	36.23523	86.23984	no
3-Chlorophenol	---	---	538.0497	---	---	538.0497	538.0497	538.0497	1280.558	0.724705	1.724797	no
4-Chlorophenol	69061.25	344479.8	538.0497	22099.6	182574.3	538.0497	538.0497	538.0497	1280.558	0.724705	1.724797	no
2,3-Dichlorophenol	---	---	215.2199	---	---	215.2199	215.2199	215.2199	512.2233	0.289882	0.689919	no
2,5-Dichlorophenol	---	---	2690.249	---	---	2690.249	2690.249	2690.249	6402.792	3.623523	8.623984	no
2,6-Dichlorophenol	---	---	1076.099	---	---	1076.099	1076.099	1076.099	2561.117	1.449409	3.449594	no
3,4-Dichlorophenol	---	---	1614.149	---	---	1614.149	1614.149	1614.149	3841.675	2.174114	5.17439	no
2,4-Dichlorophenoc-												
acetic acid (2,4-D)	---	---	538049.7	---	---	538049.7	538049.7	538049.7	1280558	724.7045	1724.797	no
2-(2,4,5-Trichlorophen-												
oxy) propionic acid												
(2,4,5-TP, Silvex)	---	---	53804.97	---	---	53804.97	53804.97	53804.97	128055.8	72.47045	172.4797	no
METALS AND CYANIDE												
Total Arsenic	130639.3	573810.6	573597.3	41804.57	304119.6	573597.3	41804.57	54763.98	130012.2	73.76215	175.1147	no
Total Cadmium	41189.75	10708.81	196186.9	13180.72	5675.668	196186.9	5675.668	7435.126	17651.33	10.01444	23.77475	no
Chromium III	858625.8	2771391	1398161	274760.3	1468837	1398161	274760.3	359935.9	854504.4	484.8013	1150.941	no
Chromium VI	2833.134	18985.86	1552947	906.6029	10062.51	1552947	906.6029	1187.65	2819.535	1.599657	3.79766	no
Total Copper	20231.62	127034.6	1.8E+007	6474.118	67328.36	1.8E+007	6474.118	8481.094	20134.51	11.42327	27.11937	no
Total Lead	143690	55714.46	1691330	45980.8	29528.66	1691330	29528.66	38682.55	91834.14	52.10191	123.6923	no
Total Mercury	893.772	61.54401	30760.57	286.007	32.61833	30760.57	32.61833	42.73001	101.443	0.057553	0.136635	yes
Total Nickel	1266284	1399291	---	405211	741624.4	---	405211	530826.4	1260206	714.9755	1697.384	no
Total Zinc	148821.6	1352184	1.1E+008	47622.93	716657.7	1.1E+008	47622.93	62386.03	148107.3	84.02837	199.4872	no
Total Cyanide	8276.531	9329.662	3571574	2648.49	4944.721	3571574	2648.49	3469.522	8236.803	4.673133	11.09423	no
DIOXIN												
2,3,7,8 TCDD; dioxin	---	---	0.022052	---	---	0.022052	0.022052	0.022052	0.052483	0.00003	0.000071	no
VOLATILE COMPOUNDS												
Benzene	405532	2018436	34164.83	129770.2	1069771	34164.83	34164.83	34164.83	81312.3	46.01695	109.5203	no
Bromoform	528327.5	2628453	121129.9	169064.8	1393080	121129.9	121129.9	121129.9	288289	163.151	388.2994	no
Bromodichloromethane	---	---	6211.787	---	---	6211.787	6211.787	6211.787	14784.05	8.366718	19.91279	no
Carbon Tetrachloride	492264.2	2449036	6832.966	157524.6	1297989	6832.966	6832.966	6832.966	16262.46	9.20339	21.90407	no
Chloroform	521114.9	2592569	164612.4	166756.8	1374062	164612.4	164612.4	164612.4	391777.4	221.718	527.6889	no
Dibromochloromethane	---	---	12112.99	---	---	12112.99	12112.99	12112.99	28828.9	16.3151	38.82994	no
1,2-Dichloroethane	2127736	1.1E+007	11181.22	680875.4	5610356	11181.22	11181.22	11181.22	26611.3	15.06009	35.84302	no
1,1-Dichloroethylene	209167.2	1040616	1552.947	66933.51	551526.5	1552.947	1552.947	1552.947	3696.013	2.09168	4.978197	no
1,3-Dichloropropylene	109271.8	543632.2	53051.7	34966.99	288125.1	53051.7	34966.99	45806.76	108747.3	61.69758	146.4729	no
Ethylbenzene	577013	2870665	1.3E+007	184644.2	1521453	1.3E+007	184644.2	241883.9	574243.4	325.7958	773.4541	no
Methyl Chloride	9917411	4.9E+007	---	3173572	2.6E+007	---	3173572	4157379	9869808	5599.615	13293.74	no
Methylene Chloride	3480110	1.7E+007	136659.3	1113635	9176260	136659.3	136659.3	136659.3	325249.2	184.0678	438.0814	no
1,1,2,2-Tetrachloro-												
ethane	168055	836081.2	4969.43	53777.61	443123	4969.43	4969.43	4969.43	11827.24	6.693375	15.93023	no

LA0070262, AI2340

[illegible]

Page 5

LA0070262, AI2340

(*1)	(*12)	(*13)	(*14)	(*15)	(*16)	(*17)	(*18)	(*19)	(*20)	(*21)	(*22)	(*23)
Toxic Parameters	WLAa	WLAc	WLAh	LTAa	LTAc	LTAh	Limiting	WQBL	WQBL	WQBL	WQBL	Need
	Acute	Chronic	HHDW	Acute	Chronic	HHDW	A, C, HH	Avg	Max	Avg	Max	WQBL?
								001	001	001	001	
	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	lbs/day	lbs/day	
Tetrachloroethylene	232608.4	1157237	20188.31	74434.68	613335.5	20188.31	20188.31	20188.31	48048.17	27.19183	64.71657	no
Toluene	229002	1139295	3.3E+007	73280.65	603826.5	3.3E+007	73280.65	95997.66	227902.8	129.3002	306.9646	no
1,1,1-Trichloroethane	952071.5	4736597	1076099	304662.9	2510397	1076099	304662.9	399108.4	947501.5	537.563	1276.199	no
1,1,2-Trichloroethane	324569.8	1614749	17393	103862.3	855817	17393	17393	17393	41395.35	23.42681	55.75581	no
Trichloroethylene	703234.6	3498623	86965.02	225035.1	1854270	86965.02	86965.02	86965.02	206976.8	117.1341	278.7791	no
Vinyl Chloride	---	---	59011.98	---	---	59011.98	59011.98	59011.98	140448.5	79.48383	189.1715	no
ACID COMPOUNDS												
2-Chlorophenol	46521.67	231447.4	538.0497	14886.94	122667.1	538.0497	538.0497	538.0497	1280.558	0.724705	1.724797	no
2,4-Dichlorophenol	36423.95	181210.7	1614.149	11655.66	96041.69	1614.149	1614.149	1614.149	3841.675	2.174114	5.17439	no
BASE NEUTRAL COMPOUNDS												
Benidine	45079.14	224270.7	2.484715	14425.33	118863.5	2.484715	2.484715	2.484715	5.913622	0.003347	0.007965	no
Hexachlorobenzene	---	---	7.764734	---	---	7.764734	7.764734	7.764734	18.48007	0.010458	0.024891	no
Hexachlorabutadiene	919.6145	1830.049	2795.304	294.2766	969.926	2795.304	294.2766	385.5024	915.2004	0.519237	1.232693	no
PESTICIDES												
Aldrin	540.9497	---	1.242357	173.1039	---	1.242357	1.242357	1.242357	2.956811	0.001673	0.003983	no
Hexachlorocyclohexane (gamma BHC, Lindane)	955.6778	376.7748	3416.483	305.8169	199.6906	3416.483	199.6906	261.5947	621.0379	0.352345	0.836482	no
Chlordane	432.7598	7.714912	5.901198	138.4831	4.088904	5.901198	4.088904	5.356464	12.71649	0.007215	0.017128	no
4,4'-DDT	198.3482	1.794166	5.901198	63.47143	0.950908	5.901198	0.950908	1.245689	2.957323	0.001678	0.003983	no
4,4'-DDE	9466.62	18838.74	5.901198	3029.318	9984.532	5.901198	5.901198	5.901198	14.04485	0.007948	0.018917	no
4,4'-DDD	5.409497	10.76499	8.385913	1.731039	5.705447	8.385913	1.731039	2.267661	5.383531	0.003054	0.007251	no
Dieldrin	42.80715	99.93503	1.552947	13.69829	52.96557	1.552947	1.552947	1.552947	3.696013	0.002092	0.004978	no
Endosulfan	39.66965	100.4733	2528.834	12.69429	53.25084	2528.834	12.69429	16.62952	39.47923	0.022398	0.053175	no
Endrin	15.57935	67.28121	1398.929	4.985392	35.65904	1398.929	4.985392	6.530864	15.50457	0.008796	0.020883	no
Heptachlor	93.76462	6.81783	2.174126	30.00468	3.61345	2.174126	2.174126	2.174126	5.174419	0.002928	0.006969	no
Toxaphene	131.6311	0.358833	7.454145	42.12195	0.190182	7.454145	0.190182	0.249138	0.591465	0.000336	0.000797	no
Other Parameters:												
Fecal Col. (col/100ml)	---	---	---	---	---	---	---	---	---	---	---	no
Chlorine	3426.015	19735.82	---	1096.325	10459.99	---	1096.325	1436.185	3409.57	1.934412	4.592384	no
Ammonia	---	7176663	---	---	3803631	---	3803631	4982757	1.2E+007	6711.325	15932.99	no
Chlorides	---	---	---	---	---	---	---	---	---	---	---	no
Sulfates	---	---	---	---	---	---	---	---	---	---	---	no
TDS	---	---	---	---	---	---	---	---	---	---	---	no
	---	---	---	---	---	---	---	---	---	---	---	no
	---	---	---	---	---	---	---	---	---	---	---	no

APPENDIX A-2 LA0070262, AI No. 2340

Documentation and Explanation of Water Quality Screen
and Associated Lotus Spreadsheet

Each reference column is marked by a set of parentheses enclosing a number and asterisk, for example (*1) or (*19). These columns represent inputs, existing data sets, calculation points, and results for determining Water Quality Based Limits for an effluent of concern. The following represents a summary of information used in calculating the water quality screen:

Receiving Water Characteristics:

Receiving Water: Red River and Rush Bayou
Critical Flow, Qrc (cfs): 1,344.25
Harmonic Mean Flow, Qrh (cfs): 7,760.88
Segment No.: 100101
Receiving Stream Hardness (mg/L): 187.00
Receiving Stream TSS (mg/L): 24.00
MZ Stream Factor, Fs: 0.33
Plume distance, Pf: N/A

Effluent Characteristics:

Company: Chemtrade Refinery Services, Inc.
Facility flow, Qe (MGD): 0.1615
Effluent Hardness: N/A
Effluent TSS: N/A
Pipe/canal width, Pw: N/A
Permit Number: LA0070262

Variable Definition:

Qrc, critical flow of receiving stream, cfs
Qrh, harmonic mean flow of the receiving stream, cfs
Pf = Allowable plume distance in feet, specified in LAC 33.IX.1115.D
Pw = Pipe width or canal width in feet
Qe, total facility flow, MGD
Fs, stream factor from LAC.IX.33.11 (1 for harmonic mean flow)
Cu, ambient concentration, ug/L
Cr, numerical criteria from LAC.IX.1113, Table 1
WLA, wasteload allocation
LTA, long term average calculations
WQBL, effluent water quality based limit
ZID, Zone of Initial Dilution in % effluent
MZ, Mixing Zone in % effluent

Formulas used in aquatic life water quality screen (dilution type WLA):

Streams:

$$\text{Dilution Factor} = \frac{Q_e}{(Q_{rc} \times 0.6463 \times F_s + Q_e)}$$

$$WLA_{a,c,h} = \frac{Cr}{\text{Dilution Factor}} - \frac{(Fs \times Q_{rc} \times 0.6463 \times Cu)}{Q_e}$$

Static water bodies (in the absence of a site specific dilution):

Discharge from a pipe:

Discharge from a canal:

Critical
 Dilution = $\frac{(2.8) P_w \pi^{1/2}}{Pf}$

Critical
 Dilution = $\frac{(2.38) (P_w^{1/2})}{(Pf)^{1/2}}$

$$WLA = \frac{(Cr-Cu) Pf}{(2.8) P_w \pi^{1/2}}$$

$$WLA = \frac{(Cr-Cu) Pf^{1/2}}{2.38 P_w^{1/2}}$$

Formulas used in human health water quality screen, human health non-carcinogens (dilution type WLA):

Streams:

$$\text{Dilution Factor} = \frac{Q_e}{(Q_{rc} \times 0.6463 + Q_e)}$$

$$WLA_{a,c,h} = \frac{Cr}{\text{Dilution Factor}} - \frac{(Q_{rc} \times 0.6463 \times Cu)}{Q_e}$$

Formulas used in human health water quality screen, human health carcinogens (dilution type WLA):

$$\text{Dilution Factor} = \frac{Q_e}{(Q_{rh} \times 0.6463 + Q_e)}$$

$$WLA_{a,c,h} = \frac{Cr}{\text{Dilution Factor}} - \frac{(Q_{rh} \times 0.6463 \times Cu)}{Q_e}$$

Static water bodies in the absence of a site specific dilution (human health carcinogens and human health non-carcinogens):

Discharge from a pipe:

Discharge from a canal:

Critical
 Dilution = $\frac{(2.8) P_w \pi^{1/2}}{Pf}$

Critical
 Dilution = $\frac{(2.38) (P_w^{1/2})}{(Pf)^{1/2}}$

$$WLA = \frac{(Cr-Cu) Pf^*}{(2.8) P_w \pi^{1/2}}$$

$$WLA = \frac{(Cr-Cu) Pf^{1/2}^*}{2.38 P_w^{1/2}}$$

* Pf is set equal to the mixing zone distance specified in LAC 33:IX.1115 for the static water body type, i.e., lake, estuary, Gulf of Mexico, etc.

If a site specific dilution is used, WLA are calculated by subtracting Cu from Cr and dividing by the site specific dilution for human health and aquatic life criteria.

$$WLA = \frac{(Cr - Cu)}{\text{site specific dilution}}$$

Longterm Average Calculations:

$$LTAA = WLAa \times 0.32$$

$$LTAC = WLAc \times 0.53$$

$$LTAh = WLAh$$

WQBL Calculations:

Select most limiting LTA to calculate daily max and monthly avg WQBL

If aquatic life LTA is more limiting:

$$\text{Daily Maximum} = \text{Min}(LTAA, LTAC) \times 3.11$$

$$\text{Monthly Average} = \text{Min}(LTAC, LTAC) \times 1.31$$

If human health LTA is more limiting:

$$\text{Daily Maximum} = LTAh \times 2.38$$

$$\text{Monthly Average} = LTAh$$

Mass Balance Formulas:

$$\text{mass (lbs/day)}: (\text{ug/L}) \times 1/1000 \times (\text{flow, MGD}) \times 8.34 = \text{lbs/day}$$

$$\text{concentration(ug/L)}: \frac{\text{lbs/day}}{(\text{flow, MGD}) \times 8.34 \times 1/1000} = \text{ug/L}$$

The following is an explanation of the references in the spreadsheet.

- (*1) Parameter being screened.
- (*2) Instream concentration for the parameter being screened in ug/L. In the absence of accurate supporting data, the instream concentration is assumed to be zero (0).
- (*3) Monthly average effluent or technology value in concentration units of ug/L or mass units of lbs/day. Units determined on a case-by-case basis as appropriate to the particular situation.
- (*4) Daily maximum technology value in concentration units of ug/L or mass units of lbs/day. Units determined on a case-by-case basis as appropriate to the particular situation.
- (*5) Minimum analytical Quantification Levels (MQL's). Established in a letter dated January 27, 1994 from Wren Stenger of EPA Region 6 to Kilren Vidrine of LDEQ and from the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards". The applicant must test for the parameter at a level at least as sensitive as the specified MQL. If this is not done, the MQL becomes the application value for screening purposes if the pollutant is suspected to be present

on-site and/or in the waste stream. Units are in ug/l or lbs/day depending on the units of the effluent data.

- (*6) States whether effluent data is based on 95th percentile estimation. A "1" indicates that a 95th percentile approximation is being used, a "0" indicates that no 95th percentile approximation is being used.
- (*7) 95th percentile approximation multiplier (2.13). The constant, 2.13, was established in memorandum of understanding dated October 8, 1991 from Jack Ferguson of Region 6 to Jesse Chang of LDEQ and included in the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards". This value is screened against effluent Water Quality Based Limits established in columns (*18) - (*21). Units are in ug/l or lbs/day depending on the units of the measured effluent data.
- (*8) LAC 33.IX.1113.C.6, Table 1, Numerical Criteria for Specific Toxic Substances, freshwater (FW) or marine water (MW) (whichever is applicable) aquatic life protection, acute criteria. Units are specified. Some metals are hardness dependent. The hardness of the receiving stream shall generally be used, however a flow weighted hardness may be determined in site-specific situations. Dissolved metals are converted to Total metals using partition coefficients in accordance with the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards". Similar to hardness, the TSS of the receiving stream shall generally be used, however, a flow weighted TSS may be determined in site-specific situations.

Hardness Dependent Criteria:

<u>Metal</u>	<u>Formula</u>
Cadmium	$e^{(1.1280[\ln(\text{hardness})] - 1.6774)}$
Chromium III	$e^{(0.8190[\ln(\text{hardness})] + 3.6880)}$
Copper	$e^{(0.9422[\ln(\text{hardness})] - 1.3884)}$
Lead	$e^{(1.2730[\ln(\text{hardness})] - 1.4600)}$
Nickel	$e^{(0.8460[\ln(\text{hardness})] + 3.3612)}$
Zinc	$e^{(0.8473[\ln(\text{hardness})] + 0.8604)}$

Dissolved to Total Metal Multipliers for Freshwater Streams (TSS dependent):

<u>Metal</u>	<u>Multiplier</u>
Arsenic	$1 + 0.48 \times \text{TSS}^{-0.73} \times \text{TSS}$
Cadmium	$1 + 4.00 \times \text{TSS}^{-1.13} \times \text{TSS}$
Chromium III	$1 + 3.36 \times \text{TSS}^{-0.93} \times \text{TSS}$
Copper	$1 + 1.04 \times \text{TSS}^{-0.74} \times \text{TSS}$
Lead	$1 + 2.80 \times \text{TSS}^{-0.80} \times \text{TSS}$
Mercury	$1 + 2.90 \times \text{TSS}^{-1.14} \times \text{TSS}$
Nickel	$1 + 0.49 \times \text{TSS}^{-0.57} \times \text{TSS}$
Zinc	$1 + 1.25 \times \text{TSS}^{-0.70} \times \text{TSS}$

Dissolved to Total Metal Multipliers for Marine Environments (TSS dependent):

<u>Metal</u>	<u>Multiplier</u>
--------------	-------------------

Appendix A-2

LA0070262, AI No. 2340

Page 5

Copper	$1 + (10^{4.86} \times \text{TSS}^{-0.72} \times \text{TSS}) \times 10^{-6}$
Lead	$1 + (10^{6.06} \times \text{TSS}^{-0.85} \times \text{TSS}) \times 10^{-6}$
Zinc	$1 + (10^{5.36} \times \text{TSS}^{-0.52} \times \text{TSS}) \times 10^{-6}$

If a metal does not have multiplier listed above, then the dissolved to total metal multiplier shall be 1.

- (*9) LAC 33.IX.1113.C.6, Table 1, Numerical Criteria for Specific Toxic Substances, freshwater (FW) or marine water (MW) (whichever is applicable) aquatic life protection, chronic criteria. Units are specified. Some metals are hardness dependent. The hardness of the receiving stream shall generally be used, however a flow weighted hardness may be determined in site-specific situations. Dissolved metals are converted to Total metals using partition coefficients in accordance with the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards". Similar to hardness, the TSS of the receiving stream shall generally be used, however, a flow weighted TSS may be determined in site-specific situations.

Hardness dependent criteria:

<u>Metal</u>	<u>Formula</u>
Cadmium	$e^{(0.7852 [\ln(\text{hardness})] - 3.4900)}$
Chromium III	$e^{(0.8473 [\ln(\text{hardness})] + 0.7614)}$
Copper	$e^{(0.8545 [\ln(\text{hardness})] - 1.3860)}$
Lead	$e^{(1.2730 [\ln(\text{hardness})] - 4.7050)}$
Nickel	$e^{(0.8460 [\ln(\text{hardness})] + 1.1645)}$
Zinc	$e^{(0.8473 [\ln(\text{hardness})] + 0.7614)}$

Dissolved to total metal multiplier formulas are the same as (*8), acute numerical criteria for aquatic life protection.

- (*10) LAC 33.IX.1113.C.6, Table 1, Numerical Criteria for Specific Toxic Substances, human health protection, drinking water supply (HHDW), non-drinking water supply criteria (HHNDW), or human health non-primary contact recreation (HHNPCR) (whichever is applicable). A DEQ and EPA approved Use Attainability Analysis is required before HHNPCR is used, e.g., Monte Sano Bayou. Units are specified.
- (*11) C if screened and carcinogenic. If a parameter is being screened and is carcinogenic a "C" will appear in this column.
- (*12) Wasteload Allocation for acute aquatic criteria (WLAA). Dilution type WLAA is calculated in accordance with the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards". Negative values indicate that the receiving water is not meeting the acute aquatic numerical criteria for that parameter. Units are in ug/L.

Dilution WLAA formulas for streams:

$$\text{WLAA} = (\text{Cr}/\text{Dilution Factor}) - \frac{(\text{Fs} \times \text{Qrc} \times 0.6463 \times \text{Cu})}{\text{Qe}}$$

Dilution WLAA formulas for static water bodies:

$$\text{WLAA} = (\text{Cr}-\text{Cu})/\text{Dilution Factor}$$

Cr represents aquatic acute numerical criteria from column (*8).

If Cu data is unavailable or inadequate, assume Cu=0.

If water quality standards are being applied at end-of-pipe, such as in the case of certain TMDL's, then a blank shall appear in this column.

- (*13) Wasteload Allocation for chronic aquatic criteria (WLAc). Dilution type WLAc is calculated in accordance with the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards". Negative values indicate that the receiving water is not meeting the chronic aquatic numerical criteria for that parameter. Units are in ug/L.

Dilution WLAc formula:

$$WLAc = (Cr/Dilution\ Factor) - \frac{(Fs \times Qrc \times 0.6463 \times Cu)}{Qe}$$

Dilution WLAc formulas for static water bodies:

$$WLAc = (Cr-Cu)/Dilution\ Factor)$$

Cr represents aquatic chronic numerical criteria from column (*9).

If Cu data is unavailable or inadequate, assume Cu=0.

If water quality standards are being applied at end-of-pipe, such as in the case of certain TMDL's, then a blank shall appear in this column.

- (*14) Wasteload Allocation for human health criteria (WLAh). Dilution type WLAh is calculated in accordance with the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards". Negative values indicate that the receiving water is not meeting the human health numerical criteria for that parameter. Units are in ug/L. Dilution WLAh formula:

$$WLAh = (Cr/Dilution\ Factor) - \frac{(Fs \times Qrc, Qrh \times 0.6463 \times Cu)}{Qe}$$

Dilution WLAh formulas for static water bodies:

$$WLAh = (Cr-Cu)/Dilution\ Factor)$$

Cr represents human health numerical criteria from column (*10).

If Cu data is unavailable or inadequate, assume Cu=0.

If water quality standards are being applied at end-of-pipe, such as in the case of certain TMDL's, then a blank shall appear in this column.

- (*15) Long Term Average for aquatic numerical criteria (LTAA). WLAA numbers are multiplied by a multiplier specified in the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards" which is 0.32. WLAA X 0.32 = LTAA.

If water quality standards are being applied at end-of-pipe, such as in the case of certain TMDL's, then a blank shall appear in this column.

- (*16) Long Term Average for chronic numerical criteria (LTAc). WLAc numbers are multiplied by a multiplier specified in the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards" which is 0.53. WLAc X 0.53 = LTAc.

If water quality standards are being applied at end-of-pipe, such as in the case of certain TMDL's, then a blank shall appear in this column.

- (*17) Long Term Average for human health numerical criteria (LTAh). WLAh numbers are multiplied by a multiplier specified in the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards" which is 1. WLAc X 1 = LTAh.

If water quality standards are being applied at end-of-pipe, such as in the case of certain TMDL's, then a blank shall appear in this column.

- (*18) Limiting Acute, Chronic or Human Health LTA's. The most limiting LTA is placed in this column. Units are consistent with the WLA calculation. If standards are being applied at end-of-pipe, such as in the case of certain TMDL's, then the type of limit, Aquatic or Human Health (HH), is indicated.
- (*19) End of pipe Water Quality Based Limit (WQBL) monthly average in terms of concentration, ug/L. If aquatic life criteria was the most limiting LTA then the limiting LTA is multiplied by 1.31 to determine the average WQBL ($LTA_{\text{limiting aquatic}} \times 1.31 = WQBL_{\text{monthly average}}$). If human health criteria was the most limiting criteria then $LTA_h = WQBL_{\text{monthly average}}$. If water quality standards are being applied at end-of-pipe, such as in the case of certain TMDL's, then either the human health criteria or the chronic aquatic life criteria shall appear in this column depending on which is more limiting.
- (*20) End of pipe Water Quality Based Limit (WQBL) daily maximum in terms of concentration, ug/L. If aquatic life criteria was the most limiting LTA then the limiting LTA is multiplied by 3.11 to determine the daily maximum WQBL ($LTA_{\text{limiting aquatic}} \times 3.11 = WQBL_{\text{daily max}}$). If human health criteria was the most limiting criteria then LTA_h is multiplied by 2.38 to determine the daily maximum WQBL ($LTA_{\text{limiting aquatic}} \times 2.38 = WQBL_{\text{daily max}}$). If water quality standards are being applied at end-of-pipe, such as in the case of certain TMDL's, then either the human health criteria or the acute aquatic life criteria shall appear in this column depending on which is more limiting.
- (*21) End of pipe Water Quality Based Limit (WQBL) monthly average in terms of mass, lbs/day. The mass limit is determined by using the mass balance equations above. $\text{Monthly average WQBL, ug/l/1000} \times \text{facility flow, MGD} \times 8.34 = \text{monthly average WQBL, lbs/day}$.
- (*22) End of pipe Water Quality Based Limit (WQBL) monthly average in terms of mass, lbs/day. Mass limit is determined by using the mass balance equations above. $\text{Daily maximum WQBL, ug/l/1000} \times \text{facility flow, MGD} \times 8.34 = \text{daily maximum WQBL, lbs/day}$.
- (*23) Indicates whether the screened effluent value(s) need water quality based limits for the parameter of concern. A "yes" indicates that a water quality based limit is needed in the permit; a "no" indicates the reverse.